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Kalpana Shyam

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KONRAD RAYNES & VICTOR, LLP

ATTN: IBM54

315 SOUTH BEVERLY DRIVE, SUITE 210

BEVERLY HILLS, CA 90212

EXAMINER

HARPER, LEON JONATHAN

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/629,939	<b>Applicant(s)</b> SHYAM ET AL.	
	<b>Examiner</b> Leon J. Harper	<b>Art Unit</b> 2166	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 November 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/26/06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/6/2006 has been entered. Claims 1,13 and 19 have been amended. No claims have been cancelled. Claims 31-36 have been added. Accordingly, claims 1-36 are pending in this office action.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5551027 (hereinafter Choy) in view of US 20020032678 (hereinafter Cornwell) and in further view of Linux Man page for fetch (hereinafter SGI).

As for claim 1 Choy discloses: wherein rows of the base table are stored in table partitions and wherein there is one index partition for each determined table partition (See column 7 lines 42-46), wherein each index partition includes nodes, wherein each node in each index partition includes at least one key column value from a corresponding table row in the table partition associated with the index partition and a location identifier identifying the corresponding table row in the corresponding table partition (See column 7 lines 19-29 and column 7 lines 38-40); determining a set of nodes, one from each index partition, whose key column value satisfies the query predicate (See column 11 lines 24-27), Ordering the set of determined nodes from the index partitions (See column 1 lines 45-55) selecting one node from the ordered set based on a position of the node in the ordering ; and returning data from the table row identified by the location identifier in the selected node (See column 11 lines 43-47 ).

Choy however, does not explicitly disclose receiving a fetch request to fetch data from a base table that satisfies a query predicate, and in response to the fetch request. Cornwell however, does disclose receiving a fetch request to fetch data from a base table that satisfies a query predicate (See paragraph 0087). SGI also discloses fetch request both receiving and responding to (See SGI page 2). It would have been obvious

to an artisan of ordinary skill in the pertinent art to have incorporated the teachings of Levine and SGI into the system of Choy. The modification would have been obvious because fetch request are very efficient ways of searching, which has been a problem in the art (See Choy column 2 lines 55-59).

As for claim 2 the rejection of claim 1 is incorporated, and further Cornwell discloses: determining whether to modify a direction (See paragraph 0093); wherein the direction comprises the direction in which index partitions are scanned to determine nodes whose key column values satisfy the query predicate (See paragraph 0100) modifying the direction (See paragraph 0099) if the determination is made to modify, and determining the set of nodes based on the direction (See paragraph 0099).

As for claim 3 the rejection of claim 2 is incorporated, and further Cornwell discloses: wherein determining whether to modify the direction of the fetch request is based on a current fetch direction and whether the current fetch direction is opposite an ordering of the index partitions (See paragraph 0099).

As for claim 4 the rejection of claim 2 is incorporated, and further Cornwell discloses: setting the fetch direction to backward if the fetch direction is backward and the fetch direction is not opposite the ordering of the index partitions or if the fetch direction is forward and the fetch direction is opposite the ordering of the index partitions, and setting the fetch direction to forward if the fetch direction is backward and

the fetch direction is opposite index the ordering of the index partitions or if the fetch direction is forward and the fetch direction is not opposite the ordering of the index partitions (See paragraph 0099).

As for claim 5 the rejection of claim 2 is incorporated, and further Cornwell discloses: if the fetch request is a first fetch of the fetch request, then selecting one node starting from one of: a lowest key value from each index partition if the fetch direction is forward or highest key value from each index partition if the fetch direction is backward (See paragraph 0087).

As for claim 6 the rejection of claim 2 is incorporated, and further Cornwell discloses: if the fetch request is not a first fetch of the fetch request, then determining whether a previous direction of a previous fetch request is a same direction as the direction of the fetch request, wherein the direction of the fetch request is capable of having been modified (See paragraph 0098); and if the previous and current directions are different, then discarding all saved nodes for the index partitions and selecting one node from a last selected node (See paragraph 0095).

As for claim 7 the rejection of claim 6 is incorporated, and further Cornwell discloses: if the previous and current directions are the same, then scanning in the direction of the fetch request from the previously saved node in each index partition (See paragraph 0096).

As for claim 8 the rejection of claim 1 is incorporated, and further Cornwell discloses: receiving a subsequent fetch request to fetch data from the base table (See paragraph 0094), replacing a previously selected node selected in a previous fetch request in the set with one node in the index partition including the previously selected node whose key column value satisfies the query predicate to form a modified set; selecting one node from the modified set; and returning the table row identified by the location identifier in the node selected from the modified set (See paragraph 0095).

As for claim 9 the rejection of claim 8 is incorporated, and further Cornwell discloses: wherein the subsequent fetch request comprises a fetch relative request to fetch a row that is multiple number of rows from the previously selected node (See paragraph 0095 “cursor is set to a number of rows”), further comprising: performing the steps of replacing the previously selected node and selecting one node multiple number of times to determine the selected node to return to the fetch relative request to satisfy a fetch quantity (See paragraph 0095).

As for claim 10 the rejection of claim 8 is incorporated, and further Cornwell discloses: wherein the subsequent fetch request comprises a fetch absolute request to fetch a row that is multiple number of rows from one end of the table (See first two lines of paragraph 0099), further comprising: determining a new set of nodes, one from each index partition, by scanning from one end of the index partitions for a first node whose

key column value satisfies the query predicate and whose key column value is greater than the previously selected node if fetching forward and the key is less than the previously selected node if fetching backward', performing the steps of replacing the previously selected node and selecting one node a number of times that is one less than the number of rows indicated in the fetch absolute request to determine the selected node to return to the fetch relative request; and performing the steps of replacing the previously selected node and selecting one node the multiple number of times to determine the selected node to return to the fetch relative request (See paragraph 0099).

As for claim 11 the rejection of claim 1 is incorporated, and further Choy discloses: determining a new set of nodes from each index partition; and caching the determined new set of nodes when performing the fetch operation (See column 8 line 65- column 9 line 6).

Choy however, does not explicitly disclose: discarding the cached keys if the fetch request is in an opposite direction of a previous fetch request; Cornwell however does disclose: discarding the cached keys if the fetch request is in an opposite direction of a previous fetch request (See paragraph 0097 and the movement of the cursor).

As for claim 12 the rejection of claim 11 is incorporated, and further Cornwell discloses: processing the fetch request to determine set of nodes in the backward direction in the previous fetch request (See paragraph 0095 "setting  $I = I-j$ " ); inverting



the keys and sorting the inverted keys; and selecting the one node containing the lowest inverted key to return (See last 5 lines of paragraph 0095 ).

As for claim 13 Choy discloses;; table partitions storing rows of the base table implemented in the computer readable medium, index partitions, wherein there is one index partition for each determined table partition (See column 7 lines 42-46), wherein each index partition includes nodes, wherein each node in each index partition includes at least one key column value from a corresponding table row in the table partition associated with the index partition and a location identifier identifying the corresponding table row in the corresponding table partition(See column 7 lines 19-29 and column 7 lines 38-40); means for determining a set of nodes, one from a plurality of index partitions, whose key column value satisfies the query predicate (See column 11 lines 24-27); means for ordering the set of determined nodes from the index partitions.

Means for ordering the set of determined nodes from the index partitions (See column 1 lines 45-55) means for selecting one node from the ordered set based on a position of the node in the ordering; and means for returning data from the table row identified by the location identifier in the selected node in response to the fetch request (See column 11 lines 43-47).

Choy however, does not explicitly disclose means for receiving a fetch request to fetch data from a base table that satisfies a query predicate, and in response to the fetch request. Cornwell however, does disclose a computer readable medium (See paragraph 0019); a base table implemented in the computer readable medium (See

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paragraph 0019) receiving a fetch request to fetch data from a base table that satisfies a query predicate (See paragraph 0087). SGI also discloses fetch request both receiving and responding to (See SGI page 2). It would have been obvious to an artisan of ordinary skill in the pertinent art to have incorporated the teachings of Levine and SGI into the system of Choy. The modification would have been obvious because fetch request are very efficient ways of searching, which has been a problem in the art (See Choy column 2 lines 55-59).

Claim 14 are system claims corresponding to method claim 2, and is thus rejected for the same reasons set forth in the rejection of claim 2.

Claim 15 is a system claim corresponding to method claim 4 and is thus rejected for the same reasons set forth in the rejection of claim 4.

Claim 16 is a system claim corresponding to method claim 8 and is thus rejected for the same reasons set forth in the rejection of claim 8.

Claim 17 is a system claim corresponding to method claim 11 and is thus rejected for the same reasons set forth in the rejection of claim 11.

Claim 18 is a system claim corresponding to method claim 12 and is thus rejected for the same reasons set forth in the rejection of claim 12.

Claims 19-30 are article of manufacture claims corresponding to method claims 1- 12 respectively, and are thus rejected for the same reasons set forth in the rejection of claims 1- 12.

As for claim 31 the rejection of claim 1 is incorporated and further Cornwell discloses: determining whether the key value of the selected node from the ordered set satisfies the query predicate; and selecting a next node form the ordered set following the selected node that odes not satisfy the query predicate (See paragraph 0087)..

As for claim 32 the rejection of claim 1 is incorporated and further Cornwell discloses: wherein determining the set of nodes from the index partitions comprises executing parallel tasks to process the index partitions (See paragraph 0087)..

Claims 33 and 34 are system claims corresponding to the method of claims 31 and 32 respectively, and are thus rejected for the same reasons as set forth in the rejection of claims 31 and 32.

Claims 35 and 36 are system claims corresponding to the method of claims 31 and 32 respectively, and are thus rejected for the same reasons as set forth in the rejection of claims 31 and 32.

### ***Response to Arguments***

Applicant's arguments filed 11/6/2006 have been fully considered but they are not persuasive.

#### **Applicant argues:**

Nowhere does the cited col. 11 anywhere teach or suggest determining a set of nodes from a plurality of index partitions and then sorting the set of determined nodes. Instead, the cited Choy discusses processing a global index table to determine partitions (PIDs) having key values satisfying the query and then sending the queries to the local indexes to handle. Applicants submit that the cited Choy teaches away from the claim requirement of determining nodes from the indexes because Choy determines key values satisfying the query predicate from the global index, not index partitions as claimed. Further, the cited Choy does not teach or suggest ordering the set of nodes determined from multiple index partitions. Instead, the cited Choy discusses obtaining PIDs from the coarse index, sorting the PIDs, removing duplicates and merging with PIDs based on the partition key. Nowhere does the cited Choy anywhere teach or suggest determining nodes from the index

#### **Examiner responds:**

Examiner is not persuaded. Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. Interpretation of Claims- Broadest Reasonable Interpretation During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.'

Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969). In this case as long as the nodes are determined from the indexes then the claims requirements are met. Moreover,

**Applicant argues:**

The Examiner cited SGI and Cornwell as teaching fetch request processing and round that it would be obvious to modify Choy's global index and local index processing scheme to be applied to fetch request processing. (Final Office Action, pgs. 3-4)

Applicants submit that even if one made this modification, this proposed modification still fails to teach or suggest the above discussed deficiencies of Choy in that the claimed technique for processing index partition to determine nodes that satisfy the query predicates is different from the cited scheme of Choy using a global index and local indexes. Moreover, Applicants submit that there is still no teaching of using the claimed index partitions to determine qualifying nodes for a fetch request as claimed.

The Examiner cited col. 2, lines 55-59 of Choy as providing the motivation to modify the index partitioning scheme of Choy to be applied to processing fetch requests. (Final Office Action, pg. 4) Applicants traverse.

**Examiner responds:**

Examiner is not persuaded. Examiner notes that that one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case it is the combination of that discloses the claimed invention.

**Applicant argues:**

Claims 2, 14, and 20 depend from claims 1, 13, and 19 and further require: determining whether to modify a direction of the fetch request, wherein the direction comprises the direction in which the index partitions are scanned to determine nodes whose key column values satisfy the query predicate; modifying the direction of the fetch request if the determination is made to modify the fetch request; and determining the set of nodes based on the direction of the fetch request. The Examiner cited para. [0093] of Cromwell as teaching the claim requirement of determining whether to modify a direction of a fetch request and cited para. [0099] as teaching modifying the direction of the fetch request. (Final Office Action, pg. 4) Applicants traverse. The cited paras. [0093] and [0099] discuss that cursors can fetch forward and para. [0094] mentions that the database program may perform a FETCH backwards operations to fetch backwards. The Examiner argues that with a fetch absolute, the operation can fetch forward or backward depending on the current direction. (Final Office Action, pgs. 12-3) Applicants traverse this finding. The cited fetch absolute determines which direction to fetch, but nowhere teaches or suggests changing or modifying the direction of the fetch based on a current fetch direction and whether the current fetch direction is opposite an

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ordering of the index partition. Instead, the cited fetch absolute determines a relative distance of the desired row from the current row and fetches toward that entry.

**Examiner responds:**

Examiner is not persuaded. Reference is made to MPEP 2144.01 - Implicit Disclosure "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968) . Cornwell discloses both fetching forward and fetching backward as a matter of choice (See paragraphs 0093,0099, and 0094) such a choice satisfies "determining whether to modify"

### **Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon J. Harper whose telephone number is 571-272-0759. The examiner can normally be reached on 7:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain T. Alam can be reached on 571-272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*LJH*  
*Leon J. Harper*  
*April 27, 2008*

/Hosain T Alam/

Supervisory Patent Examiner, Art Unit 2166